

LINEAR HALL EFFECT FINGER JOYSTICK

HTL
HALL EFFECT
JOYSTICK

2 & 4-WAY LINEAR HALL EFFECT FINGER JOYSTICK



HTL4 with Castle Style Button

The HTL series provides all of the performance of a full size, dual axis joystick in a miniature package that can be mounted in control handles, armrests and panels. The Hall effect sensors are immune to electromagnetic and radio frequency interference up to 100V/M. Programmable sensors with built-in temperature compensation ensure consistent and repeatable operation. The HTL series has excellent tactile feel for improved operator control and is available with either dusttight or IP68S watertight seal. A wide variety of output configurations are available to satisfy different applications.

Features:

- Designed for grip, armrest & panel mounting
- Proven contactless analog output Hall effect technology
- Redundant outputs available
- 1 million cycles
- Electronics watertight to IP68S
- Outstanding EMI/RFI immunity
- Variety of button styles
- RoHS/WEEE/Reach compliant

Standard Characteristics/Ratings:

MECHANICAL:

Mechanical Life: 1,000,000 all directions

Travel Angle: 23° min to 27° max

Operating Force with Boot: 16 oz typical to 20 oz max (at top of button) @ 25°C

Max Allowable Vertical & Radial Force on Button: 25.0 lbs.

Max Allowable Torque on Button: 7.5 lbs.

ELECTRICAL RATINGS:

HTL2: Rated at Vcc = 5V @ 20°C Load = 1mA (4.7KΩ)

Electrical	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output Voltage Tolerance at Center (see graph for output values)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel (see graph for output values)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Supply Current per Sensor	mA	N/A	N/A	10
Output Source Current	mA	-1	N/A	1
Output Resistance (I _o ≤ 2mA)	Ω	N/A	1	10

HTL4: Rated at Vcc = 5V @ 20°C Load = 1mA (4.7KΩ)

Electrical	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output Voltage Tolerance at Center (see graph for output values)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel (see graph for output values)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Supply Current per Sensor	mA	N/A	8	10
Output Source Current Limit	mA	-1	N/A	+1

ELECTRONICS

Seal Integrity: Electronics IP68S

ENVIRONMENTAL:

Operating Temp Range: -40°C to +85°C

Storage Temp Range: -40°C to +85°C

RFI: Withstand 100V/M, 14Hz to 1GHz

EMI: Withstand per MIL-STD-461D/SAE J1113-22 at 50Hz and 60Hz

MATERIALS:

Boot: Elastomer

Button: Thermoplastic, black

Case: Thermoplastic, black

Flange: Thermoplastic, black

Wires: 22 or 24 AWG

Mounting Hardware: Panel fastener assembly

2 & 4-WAY LINEAR HALL EFFECT FINGER JOYSTICK

HTL2 PART NUMBER CODE

HTL2		—	X	X	X	1	X	XX	X	X
Button Style	Case Style	Seal	Travel	Operating Force	Output 1 ①	Output 2 ②	Termination	Button Color		
1. Castle	1. 0.970" SQ.	1. Dusttight	1. 25°	1. 16 oz	AA. 2.5 +/- 2.0VDC	NONE	1. Wire Leads	2. Black		
2. External Castle Boot		2. Watertight			BB. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	22 AWG, UL 1569			
3. Short Double Stadium					CC. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	2. Pins			
4. Tall Concave Stadium					DD. 2.5 +/- 1.5VDC	NONE	3. Wire Leads			
5. External Bat Handle Boot					EE. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC	24 AWG, SAE AS22759			
6. External Smooth Boot					FF. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC				
7. Long Concave Y Axis Button					GG. 0.5 - 4.5VDC	0.5 - 4.5VDC				
					HH. 1.0 - 4.0VDC	1.0 - 4.0VDC				

① Outputs are from the center to the full travel position. Options "AA," "BB," "CC," "DD," "EE," and "FF" provide increased voltage in +Y; and decreasing voltage in -Y direction from one output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+Y, -Y) from 2 outputs per axis.

② Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

HTL4 PART NUMBER CODE

HTL4	-	X	X	X	X	X	XX	X	X
Button Style	Case Style	Seal	Travel	Gating	Operating Force	Output 1 ①	Output 2 ②	Termination	Button Color
1. Castle	1. 0.970" SQ.	1. Dusttight	1. 25°	1. Omnidirectional; Square on Axis Guided Feel*	1. 16 oz	AA. 2.5 +/- 2.0VDC	NONE	1. Wire Leads	2. Black
2. External Castle Boot		2. Watertight		2. Gated; Dual Axis Return to Center		BB. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	22 AWG, UL 1569	
3. Short Double Stadium				3. Omnidirectional; Round: Smooth Feel		CC. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	2. Pins	
4. Tall Concave Stadium						DD. 2.5 +/- 1.5VDC	NONE	3. Wire Leads	
5. External Bat Handle Boot						EE. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC	24 AWG, SAE AS22759	
6. External Smooth Boot						FF. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC	4. Wire Leads	
7. Long Concave Y Axis Button						GG. 0.5 - 4.5VDC	0.5 - 4.5VDC	22 AWG, UL 1569 shared powers and grounds (see schematic)	
						HH. 1.0 - 4.0VDC	1.0 - 4.0VDC	5. Wire Leads	
								24 AWG, SAE AS22759 shared powers and grounds (see schematic)	

① Outputs are from the center to the full travel position in each direction. Options "AA," "BB," "CC," "DD," "EE," and "FF" provide increased voltage in +X, +Y; and decreasing voltage in -X, -Y direction from one output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+X, +Y, -X, -Y) from 2 outputs per axis.

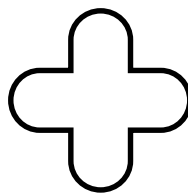
② Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

*Positive tactile feel when moved off X and Y axis positions.

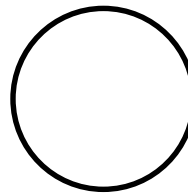
Gating Icons



Omnidirectional
Square On-Axis-
Guided Feel*



Gated
Dual Axis
Return to Center



Omnidirectional
Round
Smooth Feel



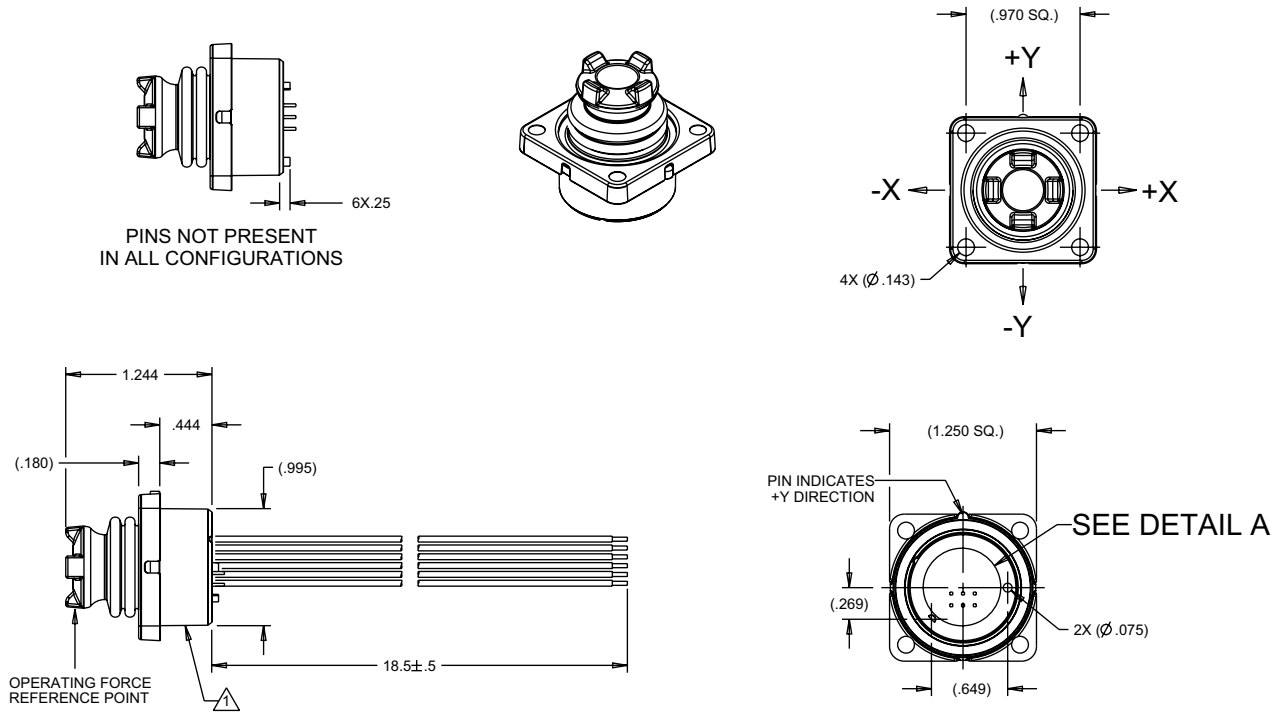
Single Axis
(HTL2 version)

*Feel defined by shading.

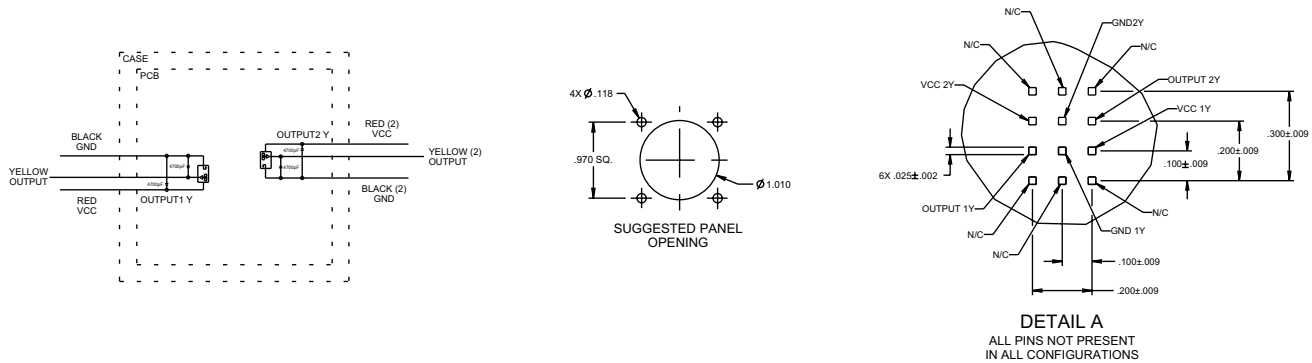
LINEAR HALL EFFECT TOGGLE

HTL
HALL EFFECT
TOGGLE

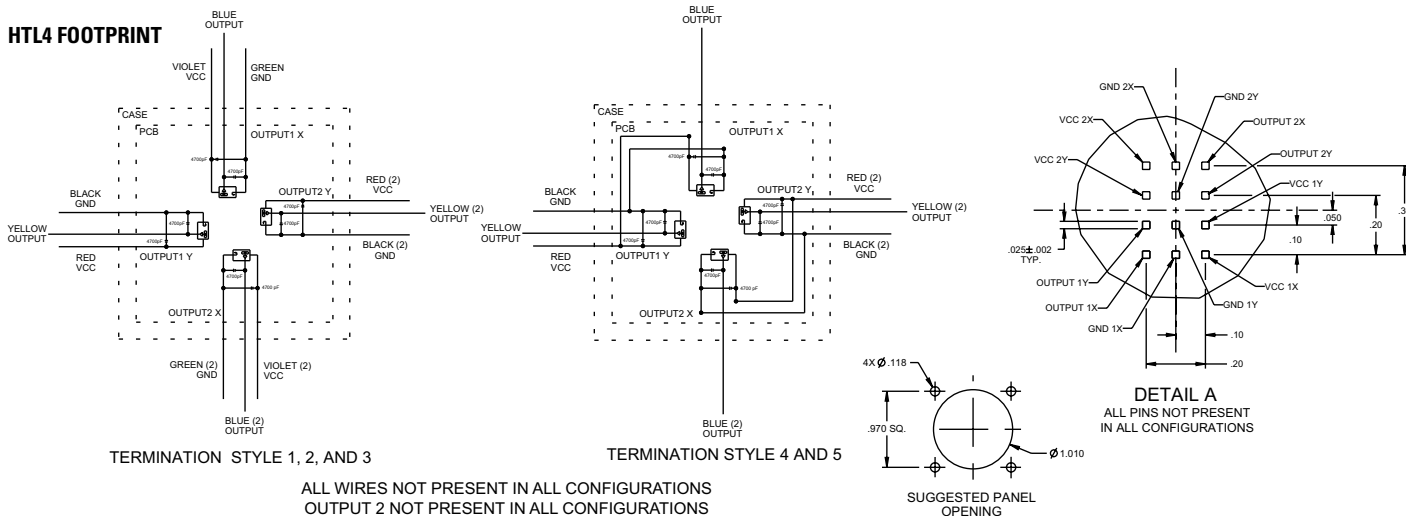
2 & 4-WAY LINEAR HALL EFFECT TOGGLE



HTL2 FOOTPRINT



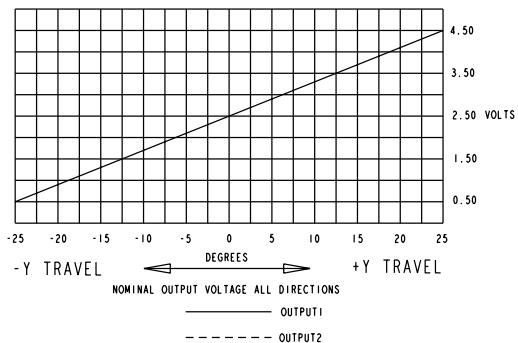
HTL4 FOOTPRINT



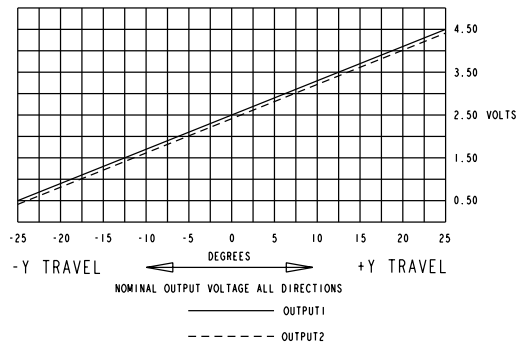
2 & 4-WAY LINEAR HALL EFFECT TOGGLE

HTL2 OUTPUTS

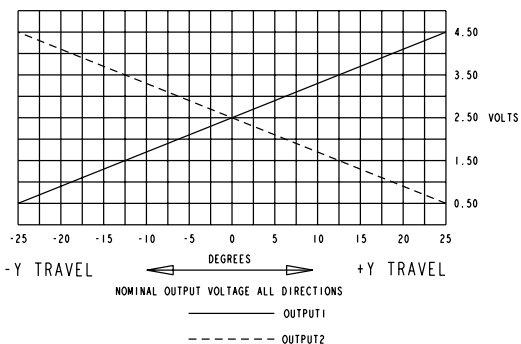
OPTION AA



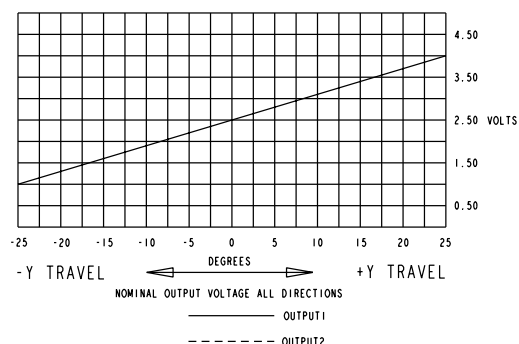
OPTION BB



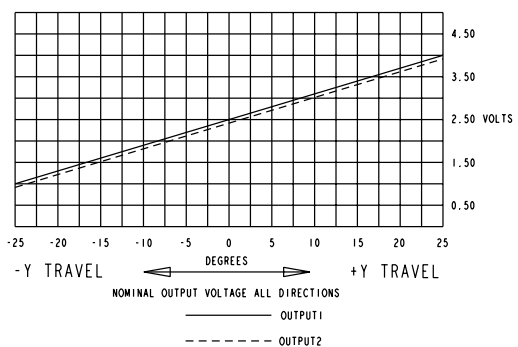
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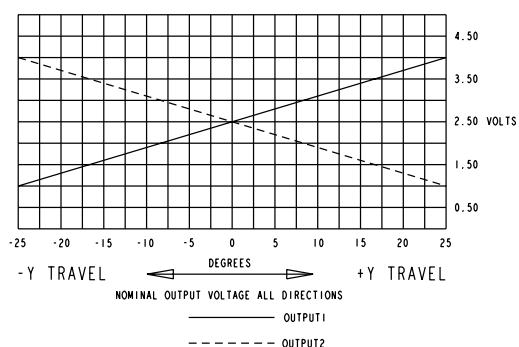
OPTION DD



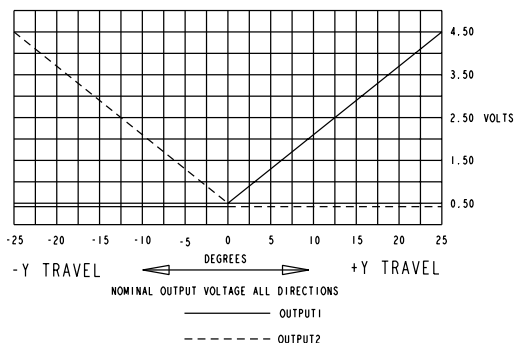
OPTION EE



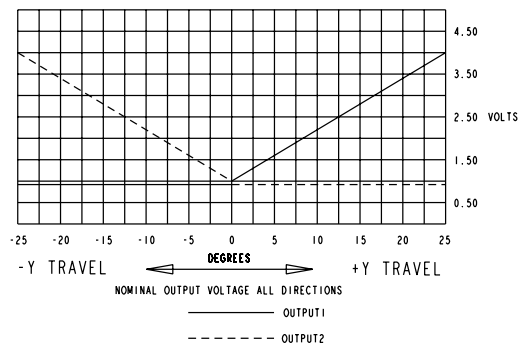
OPTION FF



OPTION GG



OPTION HH



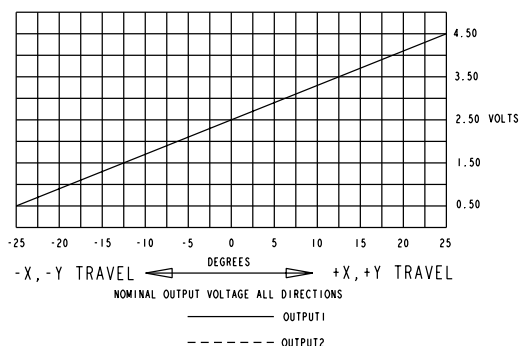
LINEAR HALL EFFECT TOGGLE

HTL
HALL EFFECT
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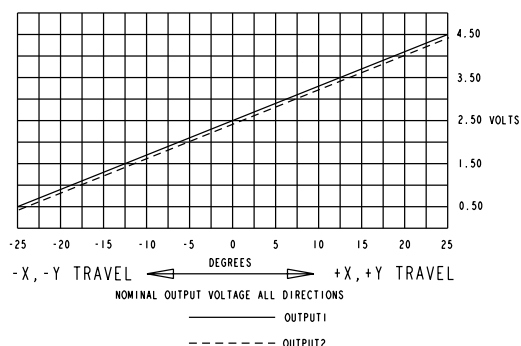
2 & 4-WAY LINEAR HALL EFFECT TOGGLE

HTL4 OUTPUTS

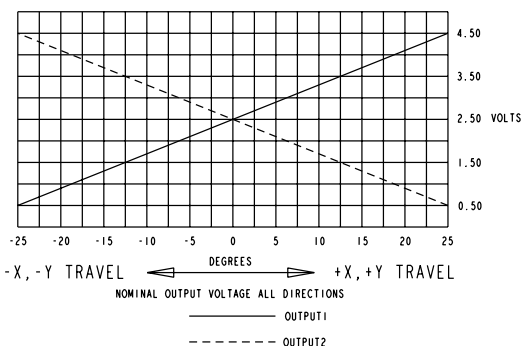
OPTION AA



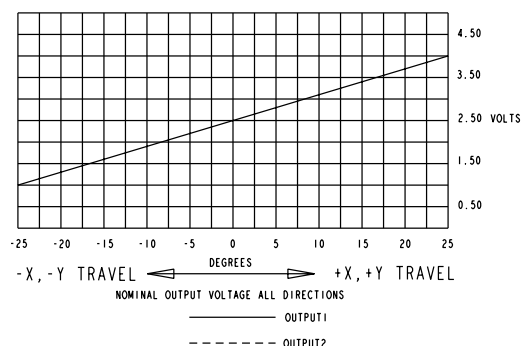
OPTION BB



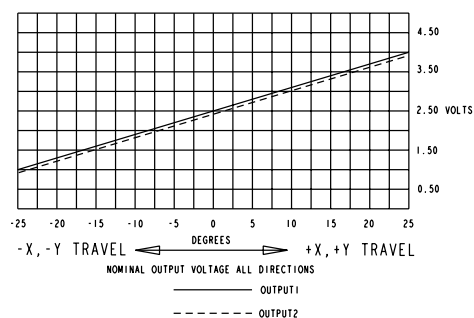
OPTION CC



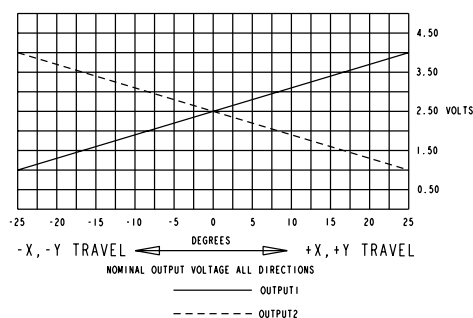
OPTION DD



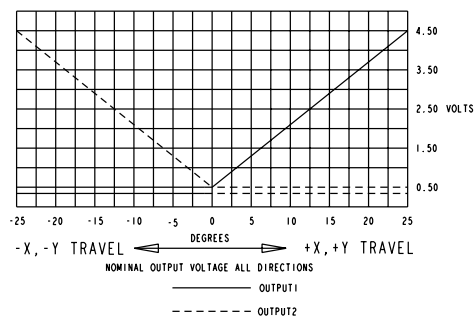
OPTION EE



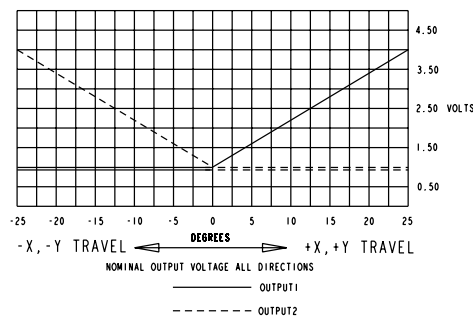
OPTION FF



OPTION GG

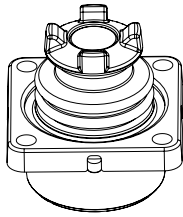


OPTION HH

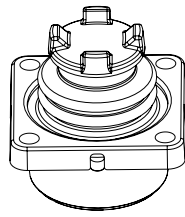


LINEAR HALL EFFECT TOGGLE

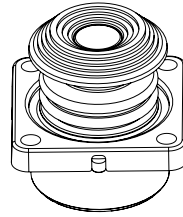
BUTTON STYLE



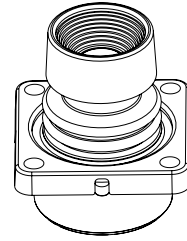
BUTTON STYLE 1
(CASTLE)



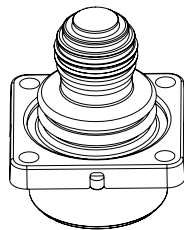
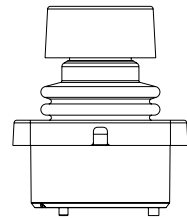
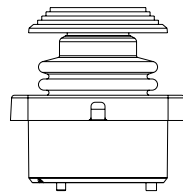
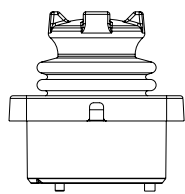
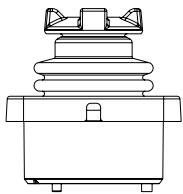
BUTTON STYLE 2
(EXTERNAL CASTLE BOOT)



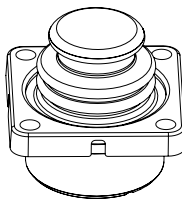
BUTTON STYLE 3
(SHORT DOUBLE STADIUM)



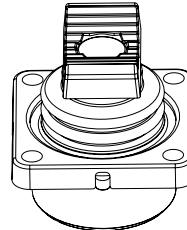
BUTTON STYLE 4
(TALL CONCAVE STADIUM)



BUTTON STYLE 5
(EXTERNAL BAT
HANDLE BOOT)



BUTTON STYLE 6
(EXTERNAL SMOOTH BOOT)



BUTTON STYLE 7
(LONG CONCAVE
Y AXIS BUTTON)

